



US 20210228798A1

(19) **United States**(12) **Patent Application Publication**  
**Kamen et al.**(10) **Pub. No.: US 2021/0228798 A1**(43) **Pub. Date: Jul. 29, 2021**(54) **INFUSION PUMP ASSEMBLY****Publication Classification**(71) Applicant: **DEKA Products Limited Partnership**,  
Manchester, NH (US)(72) Inventors: **Dean Kamen**, Bedford, NH (US); **John  
Matthew Kerwin**, Manchester, NH  
(US); **Colin Holmes Murphy**,  
Cambridge, MA (US)(21) Appl. No.: **17/170,107**(22) Filed: **Feb. 8, 2021****Related U.S. Application Data**(63) Continuation of application No. 13/946,506, filed on  
Jul. 19, 2013, now Pat. No. 10,912,882, which is a  
continuation of application No. 12/347,985, filed on  
Dec. 31, 2008, now Pat. No. 8,491,570.(60) Provisional application No. 61/018,054, filed on Dec.  
31, 2007, provisional application No. 61/018,042,  
filed on Dec. 31, 2007, provisional application No.  
61/017,989, filed on Dec. 31, 2007, provisional ap-  
plication No. 61/018,002, filed on Dec. 31, 2007,  
provisional application No. 61/018,339, filed on Dec.  
31, 2007, provisional application No. 61/023,645,  
filed on Jan. 25, 2008, provisional application No.  
61/101,053, filed on Sep. 29, 2008, provisional ap-  
plication No. 61/101,077, filed on Sep. 29, 2008,  
provisional application No. 61/101,105, filed on Sep.  
29, 2008.(51) **Int. Cl.***A61M 5/142* (2006.01)*A61M 5/14* (2006.01)*A61M 5/168* (2006.01)*A61M 5/172* (2006.01)(52) **U.S. Cl.**CPC ..... *A61M 5/14248* (2013.01); *A61M 5/1413*  
(2013.01); *A61M 5/16809* (2013.01); *A61M*  
*5/14244* (2013.01); *A61M 5/16886* (2013.01);  
*A61M 5/172* (2013.01); *A61M 2209/086*  
(2013.01); *A61M 2205/0266* (2013.01); *A61M*  
*2205/3375* (2013.01); *A61M 2205/3569*  
(2013.01); *A61M 2205/6018* (2013.01); *A61M*  
*2205/8237* (2013.01); *A61M 2005/14268*  
(2013.01)

(57)

**ABSTRACT**

A wearable infusion pump assembly including a reservoir for receiving an infusible fluid, and a fluid delivery system configured to deliver the infusible fluid from the reservoir to an external infusion set. The fluid delivery system includes a volume sensor assembly configured to receive a quantity of the infusible fluid from the reservoir. The volume sensor assembly includes an acoustically contiguous region having a volume that varies based upon the quantity of infusible fluid received from the reservoir, and an acoustic energy emitter configured to provide acoustic energy at a plurality of frequencies to excite a gas included within the acoustically contiguous region.

